

SCOPE

Journal of English Language Teaching



| p-ISSN 2541-0326 | e-ISSN 2541-0334 | https://journal.lppmunindra.ac.id/index.php/SCOPE/

Research Article

Errors in Using English Verbs by EFL Students: Tenses and Aspects Analyses

Anita Purba¹, Arsen Nahum Pasaribu², Rotua Elfrida³, Tiara K Pasaribu⁴

KEYWORDS

English verbs;

Errors analysis;

EFL students;

Tense and aspects.

CORRESPONDING AUTHOR(S):

E-mail: arsen.pasaribu@uhn.ac.id

ABSTRACT

Many scholars have conducted research on error analysis in English writing. However, scientific research on errors in using English verbs in terms of tense and aspect is still in its early stages. As a result, the purpose of this study was to identify the errors or mistakes in sentence translation from Indonesian to English that were related to tense and aspects. 25 English department students sat in the English syntax class and translated 12 Indonesian sentences into English. The findings reveal a total of 126 errors in sentence translation in terms of tense and aspect. The past perfect continuous tense, past perfect tense, present perfect continuous tense, future perfect tense, and future continuous tense are the most common errors. These findings indicate that the students were unfamiliar with the formulas and functions of these tenses, as well as aspect interpretation. As a result, English lecturers/teachers should prioritize English tenses and aspects for EFL students from the start.

INTRODUCTION

Writing is a complex language skill that language learners must learn. The complexity of writing skills has contributed to students' low language learning achievement. Students face difficulties because they must focus not only on the development of ideas in their writing, but also on the grammatical aspects of the sentences they write (Ariyanti & Fitriana, 2017). The grammatical aspect of language is a set of rules that have been established (arbitrary) to be followed in order to produce a good and correct sentence in a language (Richards & Schmidt, 2010). Foreign English learners must master five important elements in the English context if they want to master English grammar: word order, punctuation, tense and aspect, determiners, and connectors (Harmer, 2003).

Students' mastery of English grammar remains a challenge in areas where English is a second language. EFL students may encounter difficulties learning English grammar in one or more of the grammar elements mentioned above (Richards & Schmidt, 2010). Several researchers have tried to identify English grammar errors made by English learners in academic writing. Nair and Hui (2018) attempted to investigate English grammatical errors made by students during English writing classes. They concentrated on identifying errors in all aspects of writing, including grammar related to gender issues. This study discovered that male and female students had varying levels of grammatical errors in their writing. In similar vein, Gayo and Widodo (2018) investigated English writing errors at the junior high school level in Indonesia. The findings of this study also confirm that young EFL learners continue to struggle understanding and applying grammar in writing. Other

¹ Universitas Simalungun, Pemantang Siantar, Indonesia

^{2,3,4} Universitas HKBP Nommensen, Medan, Indonesia

researchers (Adrian, 2015; Fauzan et al., 2020; Songsukrujiroad et al., 2018; Pasaribu, 2021; Ratnaningsih & Azizah, 2019; Karim et al., 2018) who examined the same topic also revealed the same findings that the competence of Indonesian EFL writing skills learners, especially in mastering English grammar is still relatively low. This issue has led to the low achievement of the students in writing (Pasaribu, 2021; Rohmana & Jianggimahastu, 2019; Kharmilah & Narius, 2019).

Other studies have been conducted by researchers such as Fadilah (2019) and Fitria (2018) that focus on grammatical errors in English tenses writing by EFL learners. Fadilah (2019) investigated high school students' errors in using the simple past tense in narrative text writing. The findings confirm that students' proficiency in using the simple past in writing still needs to be improved. Fitria (2018) investigated the use of the simple present tense in writing. He also discovered that Indonesian students still struggled with mastering and applying grammar in writing, particularly English tense and aspects. The findings of this study were also supported by research by (Kumala et al., 2018). They claimed that Indonesian EFL students continue to struggle with English grammar, particularly English tenses in writing. This findings were also in line with the results of research by Amiri and Putch (2017) and Al-husban (2018) that EFL students in other countries such as Malaysia and Saudi Arabia experienced the same issues.

Based on the findings of the preceding study, this study attempts to delve deeper into how Indonesian EFL learners understand and apply English tenses and aspects. The English tense refers to the relationship between the action and the time of the speech (Harmer, 2003). It is divided into three sections: present tenses, past tenses, and future tenses. Aspects are concerned with the speaker's internal structure of the situation, as well as the speaker's vision and interpretation of the temporal situation. Aspects include simple past tense, present continuous tense, present perfect tense, future continuous tense, future perfect tense, future perfect continuous tense, and simple future perfect continuous tense, and simple future perfect continuous tense.

METHOD

This study employed mixed method, namely: the combination of the descriptive qualitative method and descriptive quantitative method (Cresswell, 2014). The research participants were 25 English department students enrolled in the Syntax class. Third semester students were asked to translate 12 sentences from Indonesian to English for data collection. Furthermore, the translation results are manually analyzed, with special attention paid to the use of tenses that are appropriate and in accordance

with the context of the time of the Indonesian sentence being translated. Tense analysis will concentrate on the choices made when the action occurs, whether in the past, present, or future. The analysis of aspects, on the other hand, relates to the specific or detailed time of the action in each tense.

There were 12 Indonesian sentences to be translated into English. Each sentence represents one of the twelve English tenses. The tenses of the fifteen sentences are randomized in such a way that students cannot easily guess the tenses of each sentence. The sentence was then translated by handwriting on paper by all students. When using the Microsoft Word program, this is done to avoid auto check or auto correct.

The twelve sentences to be translated are: 1. Andy selalu belajar setiap malam; 2. Apa yang sedang kamu pikirkan?; 3. Ayah bekerja di kantor kemarin; 4. Besok guru bahasa inggris akan berangkat ke Jakarta; 5. Pada akhir tahun ini, Susy telah menyelesaikan studi nya dari universitas; 6. Semua siswa telah menyerahkan pekerjaan rumah mereka (PR) kepada guru; 7. Para siswa telah belajar bahasa Inggris selama satu jam; 8. Semalam waktu ayah pulang ke rumah, saya sedang mengerjakan PR; 9. Ketika lonceng berbunyi, saya sudah selesai mengerjakan latihan bahasa inggris kemarin; 10. Dua hari yang lalu, ketika ibu saya tiba di tempat kost saya, saya baru menyeterika satu jam; 11. Besok jam 9, kami sedang belajar di ruangan kelas; 12. Pada saat kamu datang jam 10 besok, seminar itu sudah berlangsung selama satu jam. The translation results of the 12 sentences by the 25 students were 300 sentences in total.

RESULTS AND DISCUSSION

This study attempts to uncover the difficulties encountered by EFL university students when using English verbs in relation to the selection of English tenses and aspects. Twelve Indonesian sentences were provided for translation, one for each of the twelve tenses. Before being translated into English, the twelve sentences were arranged at random. Each student's twelve English translations were evaluated in terms of the appropriateness of the tense choice and the alignment of aspects of each sentence in English.

The study's findings were discussed in terms of the appropriateness of the tenses used and aspects of sentence structure. One of the difficulties that EFL students face was determining the appropriate tense for the sentence to be translated. Before translating an Indonesian sentence into English, consider the time information to determine the appropriate tense. The aspect, on the other hand, refers to the sentence structure in each tense (past, present, future). It is referred to as a tense sub-category,

for example: past continuous tense, present continuous tense, future continuous tense (Perlin et al., 2020; Harmer, 2003). The data demonstrates how the translated Indonesian sentences do not correspond to the tense and sentence structure choices. The following research findings are discussed in detail to show the specifics of each translation error made by students.

Sentence 1: Andy selalu belajar setiap malam. This sentence is translated into "Andy was studying every night." Sentence 1 "Andy always studies every night" it is clear that the adverbs 'selalu' and 'setiap malam' indicate that these sentences when translated into English would be more in line with the simple present tense. One of the functions of the simple present tense is to display actions that are performed repeatedly as a habitual action. Therefore, the characteristics of the adverbs of time used are the repetition of action elements from the adverbs, such as 'always', 'sometimes', and 'every day'. In sentence 1 above it should be translated into English as "Andy always studies every night". Then errors also occur in the sentence which is translated as "Andy always studies every night". The choice of tense is correct but the form of the verb 'study' should have changed to the singular 'studies' because the sentence has the third singular subject 'Andy'. Errors in choosing tense in translating sentences from Indonesian are also shown in sentence 2 below.

Sentence 2. Apa yang sedang kamu pikirkan? The choice of tense and aspects in translating the sentence "Apa yang sedang kamu pikirkan?" to "What do you think?" is incorrect. The use of the word 'sedang' (on progress) in the sentence "Apa yang kamu pikirkan?" indicates that the sentence is more suitable to be translated into the present progressive/continuous tense aspect. So the sentence should be translated into English as "What are you thinking?" Furthermore, errors in selecting tenses in translating Indonesian sentences can also be seen in the following data analysis. Translation errors in sentence 2 can also be seen in the sentence "What are you thinking?" and "What are you thinking?" The former sentence indicates the tense choice is correct; however the sentence structure is incorrect. The auxiliary 'are' should precede the subject 'you'. Thus, the sentence is appropriately translated into "What are you thinking?" While the sentence "What are you think?" infinitive verb 'think' should be changed to present participle form 'thinking'

Sentence 3: Ayah bekerja di kantor kemarin. The sentence is translated into "My father work in the office yesterday". The translation of sentences in sentence 3 into English still shows errors in choosing the right tense. In the sentence "Dad worked in the office yesterday" clearly shows that the sentence is included in the aspect of the simple past tense category. The results of the translation

of the sentence "Ayah bekerja di kantor kemarin" shows that students understand that the sentence indicates an action that occurred in the past. The students did not understand that the sentence should be translated into the simple past form. The translation would be "My father worked in the office yesterday." Other translation results from students can be seen in the following sentences: "My father was working in the office yesterday", "My father was working in the office yesterday", and "My father worked in the office yesterday". In the first, second, and third sentences are found sentence construction errors on aspects. The words of 'was work' and 'yesterday' in the first sentence indicate that the student does not understand the sentence structure of simple past tense. While the second sentence, the choice of aspects taken by students is past continuous tense. In the third sentence, the verb "works" should change to the past form "worked" because the word "yesterday" indicates that the sentence is in the past tense. The use of tenses and aspects in translating sentences in sentence 4 below also has several errors as found in the following description.

Sentence 4: Besok guru bahasa Inggris akan berangkat ke Jakarta. This sentence was translated into "Tomorrow, English teacher go to Jakarta". This sentence is included in the simple present aspect. The choice of inappropriate aspect, even though the adverb of time 'future', has shown that the sentence is in the future tense. Some mistakes in the use of aspects are also indicated by the following translation sentences: "Tomorrow the English teacher will go to Jakarta" and "Tomorrow the English teacher will be leaving to Jakarta". In the first sentence, the error occurs when the word 'goes' does not go with the modal 'will'. The infinitive 'go' should come after the modal 'will'. The second sentence is set in the future continuous tense. The appropriate tense and aspect of the translation should be in simple future tense. Furthermore, in sentence 5, there is also an error in determining the tense and aspects that are in accordance with the context of translation into English.

Sentence 5: Pada akhir tahun ini, Susy telah menyelesaikan studi nya dari universitas. Sentence 5 was translated into "At the end of this year, Susy will finish her study from the university". The sentence resulting from this translation basically shows the appropriate tense but is not appropriate in selecting the future tense aspect. This sentence should be translated as "By the end of this year, Susy will have finished her study from university". Whereas in the following sentences, the translation results of the sentence are in a different tense, namely the present tense: "The end of this year, Susy has finished her study from her university", "At the end of the year, Susy is finished her study from university", and "By the end of the year, Susy has finished her study from the university". The three sentences also show errors in the sentence

structure according to the aspects contained in the present tense.

Sentence 6: Semua siswa telah menyerahkan pekerjaan rumah mereka (PR) kepada guru. This sentence was translated as "All students has given their homeworks to the teahers". The tense and aspects of this sentence have shown compatibility, namely the present perfect tense. However, there is an error in the use of the auxiliary 'has' which should be plural 'have' so that it meets the plural subject 'all students'. Then the uncountable word 'homework' should not add with 's'. The same case is also found in the following translated sentences: "All students have already give their homeworks to the teacher", "All of the students have given the homework to their teachers", and "All of the students have been given their homeworks to the teacher". This sentence should be translated as "All the students have submitted their homework to the teacher".

Sentence 7: Para siswa telah belajar bahasa Inggris selama satu jam. Sentence 7 is translated into the correct tense, namely the present tense, but the aspects chosen are not appropriate. As seen in the following sentences: "The students have studied English language for one hour", "The students have studied English for one hour", "The student has been studied the English one hour", "Students have studied English for one hour." In the first sentence the subject (plural) does not agree with the verb (singular). In the second sentence, the verb 'study' which is infinitive form, should be "studied" in the past participle form to meet the rule of present participle. The third sentence is in simple present tense. Therefore, sentence 7 should be translated to the present perfect continuous tense "The students have been studying for one hour".

Sentence 8: Semalam waktu ayah pulang ke rumah, saya sedang mengerjakan PR. This sentence, based on the context of the time used, is classified into the aspect of past continuous tense. Errors in translating can be seen from the following sentences: "Last night, when my father went home, I am studying my homework", "Yesterday when my father came home, I was doing my homework", Last night, when my father came to me home, I am studying my homeworks", "Last night, when my father was home, I was working on my homework". In the three translated sentences above there are errors in the sentence structure. Meanwhile, the selection of aspects in the first and third sentences is appropriate. In the second sentence, the choice of aspect is not in accordance with the context of sentence 8. Although the adverb of time "last night" has indicated that the tense of the sentence is in the past tense, the sentence is translated in the present tense. Sentence 8 is appropriately translated into "Last night when my father went home, I was doing my homework".

Sentence 9: Ketika lonceng berbunyi, saya sudah selesai mengerjakan latihan bahasa inggris kemarin. When this sentence is translated into English, it will meet the aspect of the present perfect tense. Sentence 9 should be translated into "When the bell rang, I had finished doing my English exercises". However, the students still made some errors in translation. The following sentences show some errors or mistakes in deciding the appropriate tense or aspects: "When the bell rings, I have finished the English exercises yesterday", "When the bell is ring, I finished my English exercises yesterday", "When the bell is ringing, I have finished the English exercises", "When the bell was rang, I had finished the English exercises yesterday", and "When the bell was ringing, I have already finished to do the English exercises yesterday". In the four sentences above, errors were found in determining the correct tense and aspect. Besides that, there are also errors in writing sentence structures such as "when the bell was rang," where the word to be 'was' should be omitted from the sentence structure.

Sentence 10: Dua hari yang lalu, ketika ibu tiba di tempat kost saya, saya baru menyeterika satu jam. Sentence 10, based on the context of the time, is classified into past tenses and the aspect of past perfect continuous tense. The sentence on the bag when translated into English becomes "Two days ago, When my mother arrived at my boarding house, I had been ironing for one hour". However, several students still made errors or mistakes in translating the sentence. Several following sentences show the errors in constructing the sentence in terms of tense and aspect: "Two days ago when my mother arrived at my boarding house, I just ironed one hour," "Two days ago, when my mother arrived at my boarding house, I just iron for one hour," "Two days ago when my mother arrived in my boarding house I just ironed for one hour," "Two days ago when my mother arrived in my boarding house I just ironed for one hour," "Two days ago when my mother arrived at my boarding house I just ironed for one hour". The first sentence is stated in the present tense, while the other sentences are in the past tense. The errors found in the last three sentences are as a matter of aspect choice and sentence structure.

Sentence 11: Besok jam 9, kami sedang belajar di ruangan kelas. Sentence 11 ini secara tense dan aspect digolongkan ke future continuous tense. This sentence should be translated as "Tomorrow at 9 A.M., we will be studying in the classroom." Some of the mistakes made by students in translating this sentence were related to the inappropriate choice of tense and aspect, as in "Tomorrow at 9, we are studying in the classroom." While the errors that are mostly made are related to sentence structures

that are not in accordance with the tense formula, such as "Tomorrow at 9, we are studying in the classroom." While the errors that are mostly made are related to sentence structures that are not in accordance with the tense formula, such as "Tomorrow at 9, we will study in classroom," "Tomorrow at 9, we will studying in the class," and "Tomorrow at 9, we shall study in the classroom."

Sentence 12: Pada saat kamu datang jam 10 besok, seminar itu sudah berlangsung selama satu jam. This sentence is categorized into the future perfect continuous tense. Sentence 12 should be translated as "When you come tomorrow at 10 A.M., the seminar will have been lasting for one hour." However, the students still made errors and mistakes when translating the sentence, such as: "When you come at 10 o'clock tomorrow, the seminar will start for one hour", "When you are coming tomorrow at 10 o'clock, the seminar has been going on for an hour", "When you will come at 10 tomorrow, the seminar will be done for one hour", "When you are arriving at 10 tomorrow, the seminar will be doing for one hour", "When you arrive at 10 tomorrow, the seminar has been done for one hour". In the four sentences above, the tense selection is appropriate but the aspect and sentence structure selection is incorrect.

According to the findings of the above analysis, EFL university students continue to struggle with using English verbs in terms of tense and aspect (Fitria, 2018; Fadilah, 2019; Lestari, 2020). The mistakes they made in translating the 12 Indonesian sentences show a lack of understanding of English tenses and other areas that need to be improved (Xie, 2019; Nodoushan & Ali, 2018). Table 1 shows the number and percentage of tense and aspect errors made by students when translating the 12 Indonesian sentences into Indonesian.

Table 1. Errors in Using Tenses and Aspects

Tenses	Aspects	F	%
Past	Simple past tense	4	3.17
	Past continuous tense	8	6.35
	Past perfect tense	11	8.73
	Past perfect continuous tense	18	14.29
Present	Simple present tense	2	1.59
	Present continuous tense	4	3.17
	Present perfect tense	5	3.97
	Present perfect continuous tense	13	10.32
Future	Simple future	3	2.38
	Future continuous	15	11.91
	Future perfect	20	15.87
	Future perfect continuous	23	18.25
	Total	126	100

The errors in translating the 12 sentences in all English tenses and aspects are shown in Table 1. The translation

of 12 Indonesian sentences by 25 students resulted in a total of 300 sentences. In terms of selecting the appropriate tense and aspects, approximately 126 out of 300 sentences have errors. According to the data table, the tenses and aspects that have had a few translation errors are the simple past tense, simple present tense, and simple future tense. While there are aspects of each tense that is difficult for students to understand and translate. Students frequently confuse the past perfect tense and the past perfect continuous tense in the past tense. There were 11 and 18 errors in the students' translated sentences, respectively. Aspects of the present tense that are unfamiliar to students are the present perfect continuous tense. This aspect contains 15 mistakes. Finally, the future perfect continuous tense, future perfect, and future continuous tense with errors, 23, 20, and 15 sentences, are difficult for students to understand in the future tense.

CONCLUSION

This study attempts to investigate the difficulties and errors made by EFL university students when using English verbs, particularly the use of tense and aspects. After examining 300 sentences translated into English, it was discovered that nearly half of them contained errors or mistakes. The most common errors are in the following tenses: future perfect continuous, future perfect tense, past perfect continuous tense, past perfect tense, and present perfect continuous tense. The familiarity with the formulas and functions of the tenses has been identified as a major factor in making errors.

The study's findings have educational implications. English tenses should be considered as one of the primary English topics taught to EFL students at the basic level. As a result, English teachers should identify their students' difficulties with English verbs, particularly in terms of tense and aspect. To improve students' competence in using English tenses, an interesting and innovative method of teaching English tenses must be invented.

ACKNOWLEDGMENT

We are grateful for any helps of English Students who participated in this research. Every contribution to this research will lead to the success of the research.

REFERENCE

Adrian, A. (2015). An error analysis of EFL students' English writing. *English Education Journal*, 6(4), 511–523

Al-husban, N. (2018). Error analysis of Jordanian first - year university students' English language writing at Arab Open University - Case Study.

- *International Journal of Pedagogical Innovations*, 6(1), 23–30. https://doi.org/10.12785/ijpi/060103
- Amiri, F., & Putch, M. (2017). Error analysis in academic writing: A case of international postgraduate students in Malaysia. *Advances in Language and Literary Studies*, 8(4), 141–145. https://doi.org/10.7575/aiac.alls.v.8n.4p.141
- Ariyanti, A., & Fitriana, R. (2017). EFL students' difficulties and needs in essay writing. *Advances in Social Science, Education and Humanities Research* (ASSEHR), 158, 111–121.
- Cresswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Method Approaches (Fourth). SAGE Publications, Inc.
- Fadilah, F. (2019). An error analysis of simple past tense in writing of State SMK in Jakarta. *Wanastra: Jurnal Bahasa dan Sastra*, 11(1), 15–24. https://doi.org/10.31294/w.v11i1.4913
- Fauzan, U., Aulya, S. F., & Noor, W. N. (2020). Writing error analysis in exposition text of the EFL junior high school students. *Indonesian Journal of EFL and Linguistics*, 5(2), 517–533. https://doi.org/10.21462/ijefl.v5i2.330
- Fitria, T. N. (2018). Error analysis found in students' writing composition of Simple Future Tense. *ELS Journal on Interdisciplinary Studies on Humanities*, 1(3), 240–251. http://journal.unhas.ac.id/index.php/jish
- Gayo, H., & Widodo, P. (2018). An analysis of morphological and syntactical errors on the English writing of junior high school Indonesian students. *International Journal of Learning, Teaching and Educational Research*, 17(4), 58–70. https://doi.org/10.26803/ijlter.17.4.4
- Harmer, J. (2003). *The Practice of English Language Teaching*. In *Longman* (Third). Logman. https://doi.org/10.1093/elt/57.4.401
- Karim, A., Mohamed, A. R., Ismail, S. A. M. M., Shahed, F. H., & Rahman, M. M. (2018). Error analysis in EFL writing classroom. *IJEL*, 8(4), 122–138. https://doi.org/10.5539/ijel.v8n4p122
- Kharmilah, P., & Narius, D. (2019). Error analysis in writing discussion text made by students at English department of Universitas Negeri Padang. *Journal of English Language Teaching*, 8(3). http://ejournal.unp.ac.id/index.php/jelt
- Kumala, B. P., Aimah, S., & Ifadah, M. (2018). An analysis of grammatical errors on students' writing Banjar. In D. Mulyadi, H. D. Santoso, & T. D. Wijayatiningsih (Eds.), *Journal on English as a*

- *Foreign Language*, 2, 144–149. https://doi.org/10.23971/jefl.v5i2.368
- Lestari, I. (2020). Error analysis of Simple Present in writing descriptive text. *ELTICS: Journal of English Language Teaching and English Linguistics*, 5(2). https://doi.org/10.31316/eltics.v5i2.748
- Nair, M., & Hui, L. L. (2018). An analysis of common errors in ESL descriptive writing among Chinese private school students in Malaysia. *International Journal of Education and Practice*, 6(1), 28–42. https://doi.org/10.18488/journal.61.2017.61.28.42
- Nodoushan, S., & Ali, M. (2018). Toward a taxonomy of errors in Iranian EFL learners' basic-level writing. *International Journal of Language Studies*, *12*(1), 61–78. http://www.ijls.net/pages/volume/vol12no1.html
- Pasaribu, A. N. (2021). A common error analysis in students' English narrative writing. *Linguistic*, *English Education and Art (LEEA) Journal*, 4(2), 436–445. https://doi.org/10.31539/leea.v4i2.2338
- Perlin, A., Sartika, D., & Nery, R. (2020). An error analysis on the use of Simple Present Tense in paragraph writing of the second semester at English Language Education at Islamic University of Ogan Komering Ilir Kayuagung. *Journal of English Education and Linguistics*, 3(2), 1–9. https://doi.org/10.32663/edu-ling.v4i1.1688
- Ratnaningsih, S., & Azizah, A. (2019). Error analysis in the descriptive text writing of vocational high school students. *Dinamika Ilmu*, 19(1), 175–186. https://doi.org/10.21093/di.v19i1.1364
- Richards, J., & Schmidt, R. W. (2010). *Longman Language Teaching & Applied Linguistics* (Fourth). Pearson Education Limited.
- Rohmana, W. I. M., & Jianggimahastu, P. (2019). Error analysis of students' recount text writing junior high school student. *JETLe (Journal of English Language Teaching and Learning)*, *1*(1), 10. https://doi.org/10.18860/jetle.v1i1.7757
- Songsukrujiroad, S., Xin, C., & Kaewyod, W. (2018). Error analysis on writing Chinese essay: A case study of Chinese major students of UBRU. International Journal of Integrated Education and Development, 3(1), 5–18.
- Xie, Q. (2019). Error analysis and diagnosis of ESL linguistic accuracy: Construct specification and empirical validation. *Assessing Writing*, 41(July 2018), 47–62. https://doi.org/10.1016/j.asw.2019.05.002
 - DOI: http://dx.doi.org/10.30998/scope.v7i2.16437